HANSEN MANUFACTURING COMPANY
INCORPORATED

TIMING MOTORS · TIMING MACHINES · CLOCK MOVEMENTS · MAGNATORC D.C. MOTORS

OVER FIFTY YEARS SYNCHRON ® OF SERVICE

AREA CODE 812 FULTON 5-3415
TWX 812-291-4120
PRINCETON, INDIANA 47570

T. Nelson
Poughkeepsie, New York

6-13-66

Dear Mr. Nelson:

We are pleased to receive your request for information about Hansen timing motors. The enclosed material should give you the data you need.

If this material does not provide adequate information to help you answer your timing problem, our engineering department is ready to assist you further. Please feel free to contact us at any time. Naturally, all discussions will be held in absolute confidence.

Or, if you wish, one of our qualified representatives will be glad to serve your needs. Hansen Manufacturing Company representatives are:

Carey & Associates
2626 W. Mockingbird
Dallas, Texas
Phone: FL 1-0262

Carey & Associates
3315 West 12th St.
Houston, Texas
Phone: UN 9-3623

Fromm Company
6617 West North Avenue
Oak Park, Illinois 60302
Phone: 386-9154

R. S. Hopkins Company
15016 Ventura Blvd.
Sherman Oaks, Calif. 91403
Phone: 872-0505

H. C. Johnson Agency, Inc.
111 Mt. Hope Ave.
Rochester, New York 14620
Phone: 232-2688

Melchior & MacPherson, Inc.
820B Cherry Street
San Carlos, Calif. 94070
Phone: LYtell 1-7383

Winslow Electric Company
3540 Ridge Road
Cleveland, Ohio 44102
Phone: ME 1-9393

Winslow Electric Company
P. O. Box 278
Essex, Conn.
Phone: SOuth 7-8229

Winslow Electric Company
P. O. Box 352
Narberth, Pa.
Phone: MO 4-2182

Winslow Electric Company
30 West 60th St. - Apt. 12-T
New York, New York 10023
Phone: 582-8151

All representatives have TWX. Please consult directory.

For additional information on Hansen timing motors, please contact me in Princeton, Indiana or call or write our representative located nearest your office.

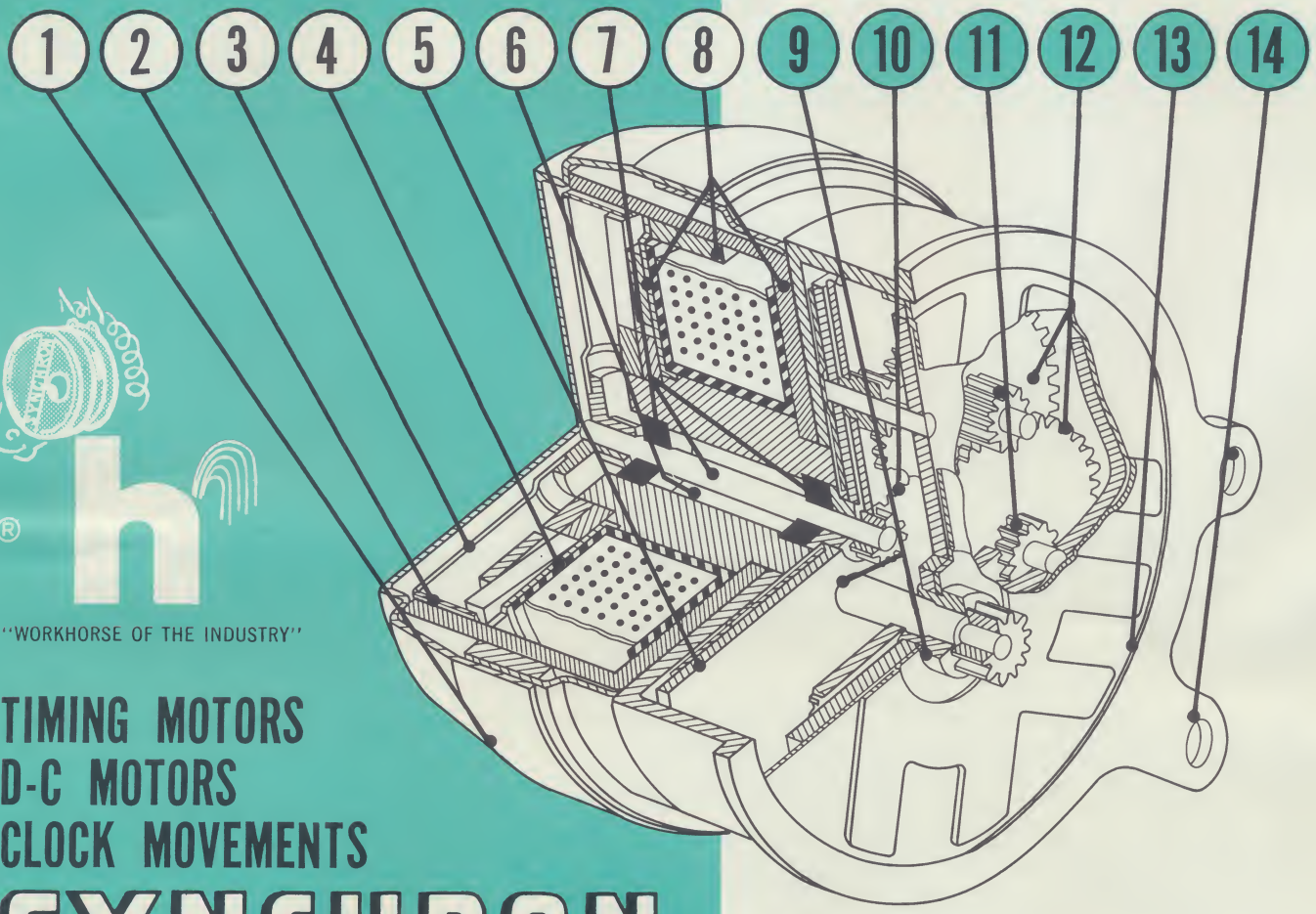
Sincerely yours,

A. F. Bridger

A. F. Bridger
Sales Manager

By Invitation Member

Emblem of
Business Character
RICE LEADERS
OF THE WORLD
ASSOCIATION
Represents High Standing in
Name · Product · Policy



"WORKHORSE OF THE INDUSTRY"

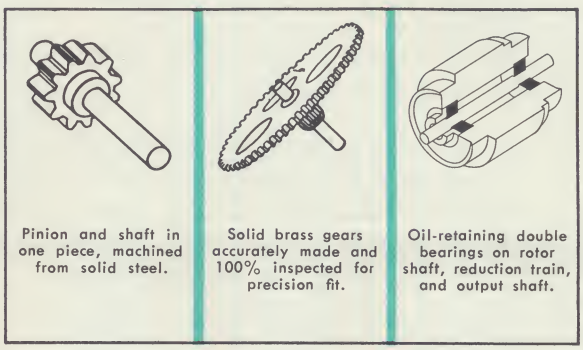
TIMING MOTORS
D-C MOTORS
CLOCK MOVEMENTS
SYNCHRON®

Precision Engineering

(Numbers refer to cut-away view)

1. Rotor cover of heavy brass.
2. Patented, hardened steel rotor ring.
3. Aluminum rotor ring support.
4. Coil assembly with molded nylon bobbin.
5. Special bronze bearing plates with oil retainers to assure lubrication of bearings.
6. Oil storage reservoir.
7. Ultra-precision polished rotor shaft rotates in double bearings to assure smooth and quiet operation.
8. Patented two-piece field structure with rotor that rotates between inner and outer field poles. The inner and outer poles are shaded with heavy, continuous copper rings to assure maximum starting and running torque, and positive direction of rotation.
9. Double bearings on output shaft. Bronze output bearings precision turned to provide accurate centering of output pinion or shaft.
10. Phenolic gear for quiet operation.
11. One-piece steel pinions having smooth pivots running in upper and lower bronze bearing plates.
12. Brass gears. NOTE: Brass against steel assures longer life.
13. Gear case sealed against oil leakage to permit mounting in any position.
14. Four convenient mounting holes. Other mountings available.

THE HEART OF THE SYNCHRON



Pinion and shaft in one piece, machined from solid steel.	Solid brass gears accurately made and 100% inspected for precision fit.	Oil-retaining double bearings on rotor shaft, reduction train, and output shaft.

DESIGN ASSISTANCE

With confidence as trustworthy as the Synchron name, you can look to Hansen Engineers for assistance in developing the proper power application you might need for your product. Completely confidential — and yours without cost or obligation.

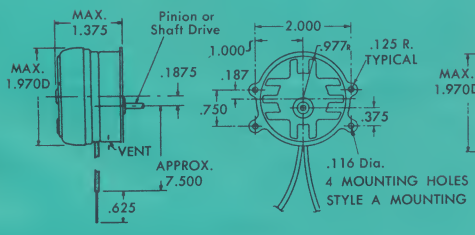
HANSEN MANUFACTURING COMPANY, INC. PRINCETON, INDIANA

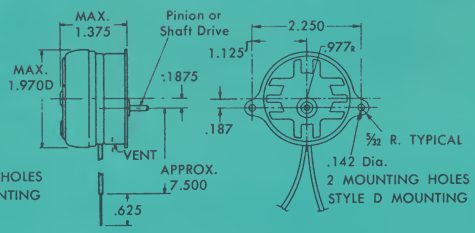
SYNCHRONOUS MOTORS

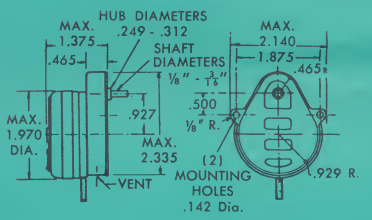
UL and CSA approvals

Catalog No. 666

SYNCHRON® A-C TIMING







TYPE "A" MOUNTS

Available in speeds from .8 RPM to 360 RPM. Operational 1-way clutch (or 2-way clutch for gear train protection) available in speeds of 6 RPM and slower.

TYPE "D" MOUNTS

Available in speeds from .8 RPM to 360 RPM. Operational 1-way clutch (or 2-way clutch for gear train protection) available in speeds of 6 RPM and slower.

TYPE "C" MOUNTS

Pear-shape motor available in speeds up to 360 RPM, but this mount recommended for the slower speeds down to .5 RPH. Operational 1-way clutch (or 2-way clutch for gear train protection) available in speeds of 6 RPM and slower.

ALL A.C. MOTORS AVAILABLE IN FOLLOWING TORQUE RATINGS (at 1 RPM):

Standard Torque — 8 in-oz. — 3 watt
Hi-Torque — 20 in.-oz. — 4 watt
Super Hi-Torque — 30 in.-oz. — 5 watt

(Gear trains generally limited to 30 in.-oz. output or 90 in.-oz. of static torque.)

Torque reduction proportional to speed increase.
Physical dimensions are not changed by torque rating.

The following **output drives**, in addition to 300 others, are available. Shaft length out of bearing: 3/8" (Standard), 1/2", 5/8", 3/4", 7/8", 1". Bearing lengths: 1/16" (Standard) or 5/16" (Extended). Diameter of shaft: 1/8" (which uses .249" dia. bearing) or 3/16" (which uses .312" dia. bearing) round, or flatted for set screw. Other shafts as well as pinions are available for numerous applications. Inquire for particular need. Drawings below show typical outputs and dimensional data.

All motors available with either **clockwise** or **counter-clockwise** rotation (facing the shaft). **Mounts** include types A, C, D, K and G. Other two-hole mounts are available.

Output speeds shown on back page.

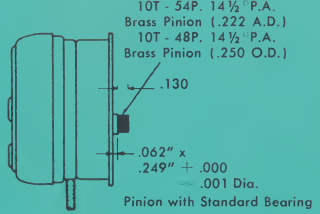
Standard voltages: 24v, 110v, 220v. Others available.

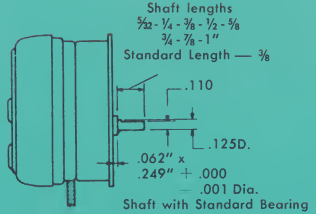
Standard cycles: 60cy., 50cy., 25cy.

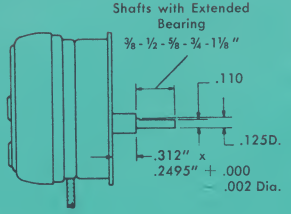
WHEN ORDERING MOTORS, please specify: Torque, type of output drive (include shaft length and diameter, and standard or extended bearing), direction of rotation, type of mount, output speed, voltage and frequency.

TYPICAL OUTPUT DRIVES

"A" mount shown here for illustration purposes only



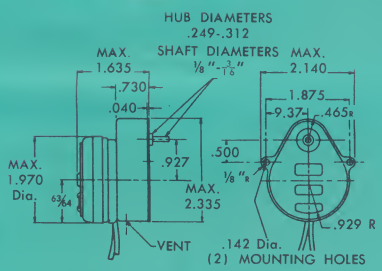




MOTORS

"PEAR-SHAPE" SYNCHRON

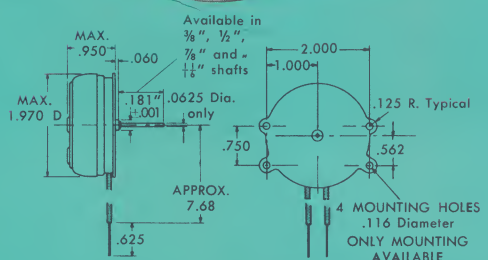
"K" MOUNT
for extra slow speeds



TYPE "K" MOUNTS

Pear-shape motor is perfect for control applications requiring extremely slow timing. Speeds from ⅓ RPH down to 1 revolution per 7 days. Operational 1-way clutch (or 2-way clutch for gear train protection) available in all speeds using this mount.

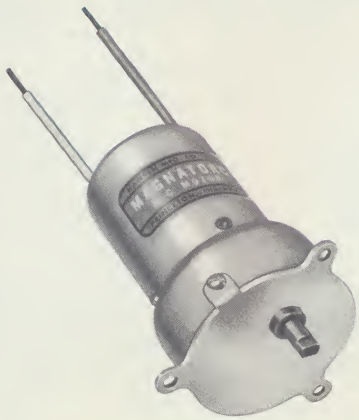
Without Gear Reduction Unit,
TYPE "G" MOUNT



Only for Speeds 500 rpm at 50cy / 600 rpm at 60cy

HANSEN MANUFACTURING COMPANY, INC.
PRINCETON, INDIANA (47570)

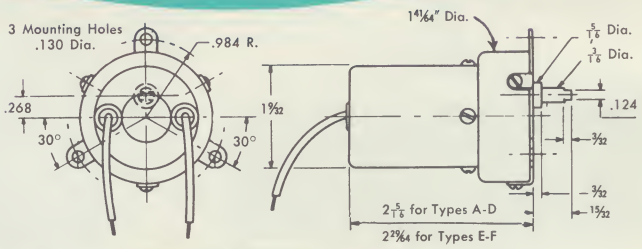
SYNCHRON®
D-C MOTORS



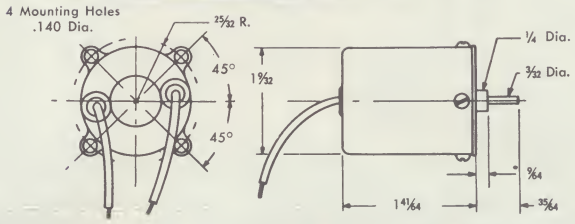
MAGNA-TORC

Used extensively in commercial and defense applications. Proven rugged dependability. Designed with unique commutation construction for more reliable operation under extreme vibration conditions.

WITH GEAR REDUCTION UNIT



WITHOUT GEAR REDUCTION UNIT



VOLTAGE	6	13	24	27
INPUT NO LOAD	180 MA. MAX.	180 MA. MAX.	130 MA. MAX.	45 MA. MAX.
INPUT WITH LOAD #	310 MA. MAX.	310 MA. MAX.	200 MA. MAX.	80 MA. MAX.
INPUT STALL	800 MA.	800 MA.	600 MA.	155 MA.
OUTPUT FT. LBS. PER MINUTE	15.8	35	43	19.1
OUTPUT H.P.	1/2083	1/946	1/766	1/1703
OUTPUT R.P.M.	5500	12,000	12,600	6600
REDUCTION IN SPEED WITH LOAD	12% #	11% #	10% #	10% #
TORQUE OF ARMATURE SHAFT	.1 OZ. @ 1 IN.	.1 OZ. @ 1 IN.	.1 OZ. @ 1 IN.	.1 OZ. @ 1 IN.

TYPES OF GEAR REDUCTION UNITS	SPEED R.P.M.	TORQUE IN. OZ.	SPEED R.P.M.	TORQUE IN. OZ.	SPEED R.P.M.	TORQUE IN. OZ.	SPEED R.P.M.	TORQUE IN. OZ.
A	293	1.9	640	1.9	672	1.9	352	1.9
B	73¼	7.5	160	7.5	168	7.5	88	7.5
C	18.31	30.5	40	30.0	42	30.0	22	30.0
D	4.58	# #	10	# #	10½	# #	5½	# #
E	1.14	# #	2.5	# #	2⅜	# #	1.375	# #
F	.286	# #	.625	# #	.656	# #	.344	# #

#THESE FIGURES WERE ARRIVED AT BY LOADS SHOWN UNDER FOOT LBS. PER MINUTE OUTPUT.
##THESE UNITS WILL PULL 5 LBS. OR MORE BUT ARE ONLY RECOMMENDED FOR 2 LBS. OR LESS CONTINUOUS DUTY.
ALL SPEEDS SHOWN MAY VARY + OR — 10%.

SYNCHRON®
CLOCK MOVEMENTS

Powered by a Synchron Motor. Clock movements designed and built for sustained accuracy. For your production of daintiest bedroom clocks, to large display clocks up to 26" in diameter under glass.

24V. — 110V. — 220V. — 25Cy. — 50Cy. — 60Cy.

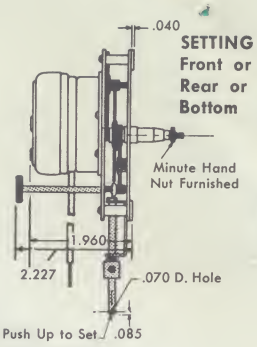
Split-second accuracy and long wearing construction, never needs oiling. Front, rear or bottom set.

Covers or dust bands available for most models.

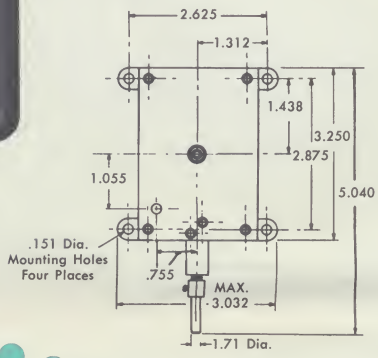
Simple mounting cuts production and assembly costs.

Special 24-hour clock movement available in C-4 rear set only.

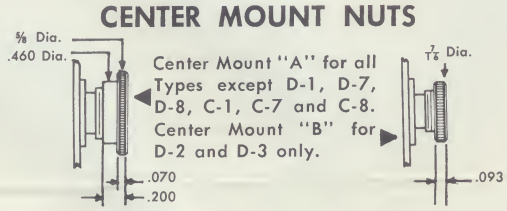
Clock hands may be purchased from:
J. H. Winn, Inc., Winchester, Mass.
Ty-Car Mfg. Co., Inc., Holliston, Mass.



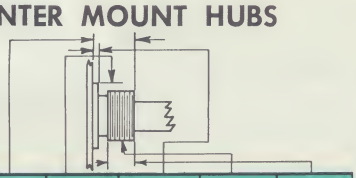
C TYPE



CENTER MOUNT NUTS

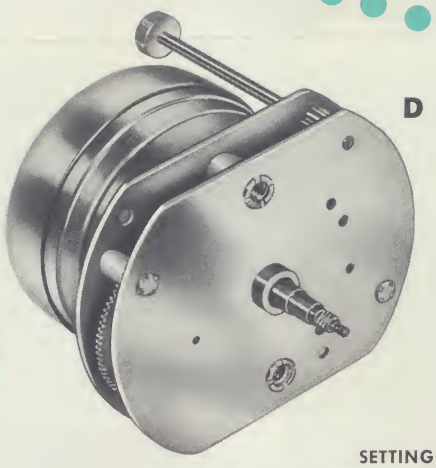


CENTER MOUNT HUBS

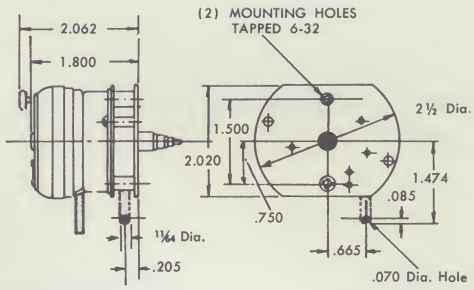


	OVER-ALL LENGTH	FLANGE DIA.	FLANGE LENGTH	THREAD	THREAD LENGTH
TYPE A	.310	½	.045	⅜-24	.195
TYPE B	.263	½	.045	5/16-36	.156

Long second hands on "D" movements should be counterbalanced.

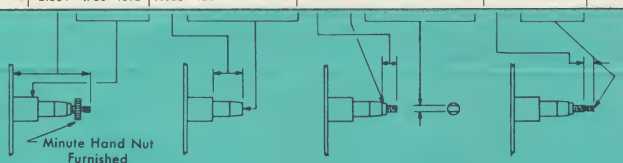


D TYPE



SETTING Front or Rear or Bottom

MODEL	CENTER ASSEMBLY			HOUR TUBE				MINUTE TUBE					SECOND SHAFT			CENTER MOUNTING AVAILABLE
	Over-all Length	Hub Length	Hub Diameter	Length	Large Dia. of Taper	Small Dia. of Taper	Taper Length	Length	Diameter	Thread	Flat Length	Flat Thickness	Length	Thread	Thread Length	
C1 or D1	.514	.040	.312	170	.159	.157	.135	.169	.125	6-32	.105	.084	.135	1-56	.090	No
C2 or D2	.764	.125	.312	.335	.159	.157	.185	.169	.125	6-32	.105	.084	.135	1-56	.090	Yes
C3 or D3	.889	.125	.312	.460	.159	.157	.185	.169	.125	6-32	.105	.084	.135	1-56	.090	Yes
C4 or D4	1.014	.325	.312	.358	.201	.197	.160	.196	.172	10-32	.130	.108	.135	2-56	.090	Yes
C5 or D5	1.389	.325	.312	.733	.201	.197	.160	.196	.172	10-32	.130	.108	.135	2-56	.090	Yes
C7 or D7	2.014	.750	.312	.933	.201	.197	.160	.196	.172	10-32	.130	.108	.135	2-56	.090	No
C8 or D8	2.504	.750	.312	1.558	.201	.197	.160	.196	.172	10-32	.130	.108	Not Available			No



SYNCHRON MOTOR SPEEDS (many others available)

SPEEDS RPM						SPEEDS RPH			
60 Cycle RPM		50 Cycle RPM		25 Cycle RPM		60 Cycle RPH		50 Cycle RPH	25 Cycle RPH
0.8	40.0	1.0	75.0	1.0		1/168	8.0	0.8	0.5
1.0	48.0	2.0	100.0	2.0		1/24	9.6	1.0	1.0
2.0	50.0	3.0	150.0			1/4	10.0	2.0	2.0
3.0	60.0	4.0	200.0			1/3	12.0	3.0	3.0
4.0	72.0	5.0	300.0			0.5	15.0	4.0	4.0
5.0	75.0	6.0	500.0			0.8	18.0	5.0	5.0
6.0	90.0	8.0				1.0	20.0	6.0	6.0
8.0	100.0	10.0				1.2	24.0	8.0	7.5
10.0	120.0	12.0				2.0	25.0	10.0	10.0
12.0	150.0	15.0				2.4	36.0	12.0	12.0
15.0	180.0	20.0				3.0	40.0	15.0	15.0
18.0	200.0	25.0				3.6	48.0	20.0	20.0
20.0	240.0	30.0				4.0	50.0	25.0	25.0
24.0	300.0	40.0				4.8	60.0	30.0	30.0
25.0	360.0	50.0				5.0	100.0	40.0	50.0
30.0	600.0	60.0				6.0	120.0	50.0	
36.0						7.2		60.0	
								100.0	

WHEN ORDERING CLOCK MOVEMENTS, please specify:

1. C or D type movement, and model number designating center assembly.
2. Mounting (front, rear or threaded center mount).
3. Type setting: front (minute hand rotated manually), rear or bottom.
4. Voltage and cycle.

QUICK FACTS ON SYNCHRON MOTORS

Self-starting — Hysteresis motor with positive direction of rotation.

Big Power — Guaranteed to pull up to 30 in ounces at 1 r.p.m.

Flexible Installation — Operates equally well mounted in any position.

Easy to Mount — Available with standard 4-hole mounting or 2-hole mounting (other mountings available).

Durable Construction — May be stalled continuously (in speeds of 1 RPM and faster) without electrical or mechanical damage.

Silicone Lifetime Lubrication — Gear train sealed for protection from dust and elements.

Rigidly Tested — Each motor must pass 51 rigid inspections before shipment.

1 Year Guarantee — Guaranteed against defective materials and workmanship for one year on all applications approved by the Hansen Engineering Department.

Laboratory Approval — Underwriters' Laboratories, Inc. and CSA approvals.

HANSEN MANUFACTURING COMPANY, INC. PRINCETON, INDIANA

CAREY & ASSOCIATES
Houston, Dallas and Beaumont, Texas
THE FROMM COMPANY
Chicago, Illinois
H. C. JOHNSON AGENCIES, INC.
Rochester, N.Y.
SPERRY GYROSCOPE OTTAWA, Limited
P.O. Box 90
Ottawa, Ontario
WINSLOW ELECTRIC CO.
New York, N.Y., Essex, Conn., Narberth, Pa.
R. S. HOPKINS COMPANY
Sherman Oaks, Calif.
EICHORN & MELCHIOR, INC.
San Carlos, Calif.
EXPORT DEPARTMENT
64-14 Woodside, N.Y. 11377
Cable "Churchin"

Handled exclusively in Canada by **SPERRY GYROSCOPE, LTD.**

HANSEN

SYNCHRON®

THIS IS YOUR OUTPUT DATA SHEET FOR THE FINEST SYNCHRONOUS TIMING MOTOR AVAILABLE!

Each motor you receive from Hansen Manufacturing Company must pass the rigid specifications of 51 tests and inspections before it leaves our plant.

Whatever your custom requirements call for in the way of output specifications you can be sure of one thing . . . if your basic unit is a Hansen motor you are assured of operational efficiency resulting from over 50 years of concentrated engineering experience in the field of timing units.

Of course, Hansen Synchronous Motors are UL and CSA approved.

Make use of the specialized experience of Hansen engineers.

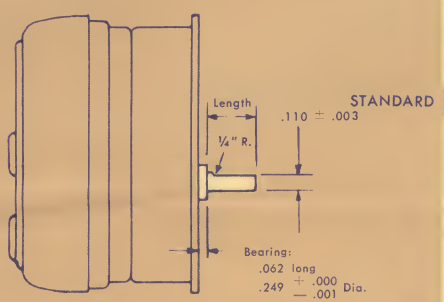
Call us, today. No obligation.

TIMING MOTORS

We can assemble your pinions, gears, or special drive connections of your own manufacture at our factory.

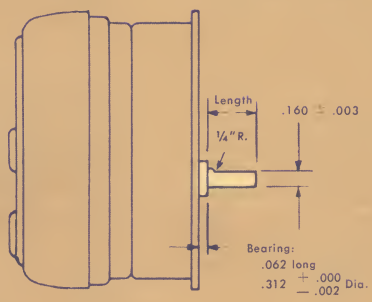
FLATTED SHAFTS

.125 ± .0005 Dia. Flatted Shafts



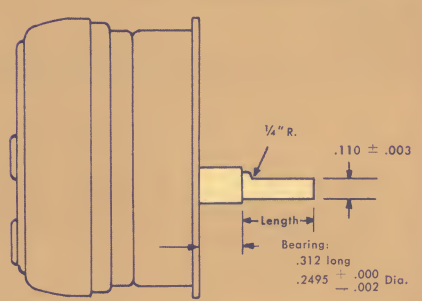
TYPE	LENGTH
10	5/32
11	1/4
STANDARD 12	3/8
13	1/2
14	5/8
15	3/4
16	7/8
17	1
18	3/16
191	5/16

.1875 ± .0005 Dia. Flatted Shafts



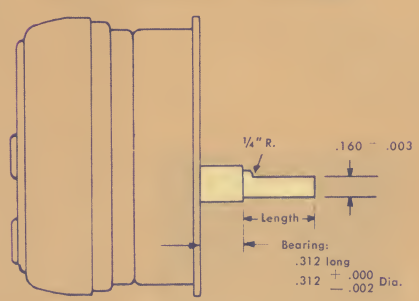
TYPE	LENGTH
146	3/8
173	3/4
174	5/8
175	1/2
176	11/16
177	1
178	1 1/4
193	5/16

.125 ± .0005 Dia. Flatted Shafts



TYPE	LENGTH
31	3/8
32	1/2
33	5/8
34	3/4
35	1 1/8
103	1

.1875 ± .0005 Dia. Flatted Shafts



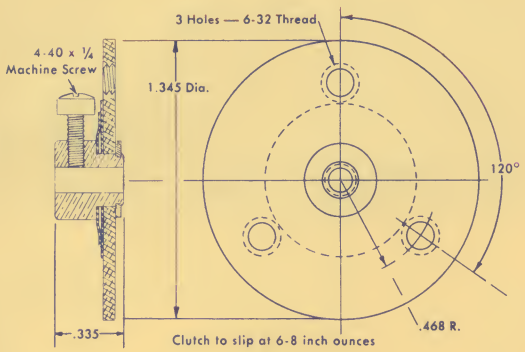
TYPE	LENGTH
149	7/16
179	1/2
180	3/4
181	1
224	3/8
248	9/16
252	5/16

HANSEN
SYNCHRON®
TIMING MOTORS

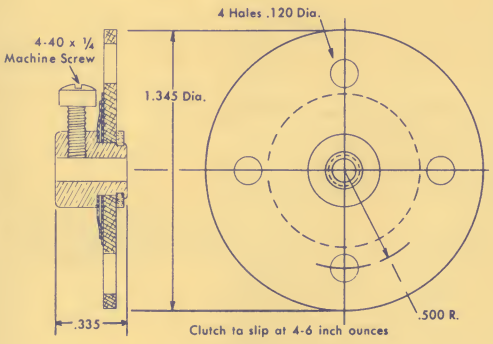
OTHER OUTPUT DRIVES AVAILABLE!

Information on a variety of knurled and slotted shafts, adapters and crank assemblies not shown can be yours upon request.

EXTERIOR CLUTCHES AVAILABLE FOR ATTACHING TO CUSTOMER'S PRODUCT



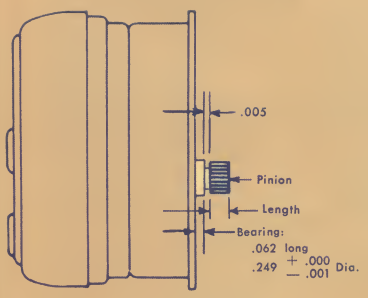
PART No. 22-2



PART No. 22-6

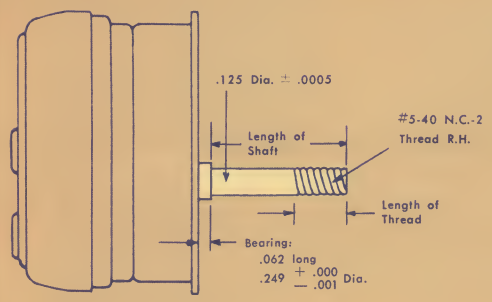
HANSEN
MANUFACTURING
COMPANY, INC.
PRINCETON, INDIANA

PINION DRIVES



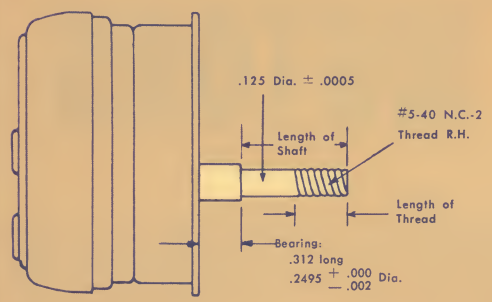
	TYPE	TEETH	PITCH	LENGTH
	39	8	32	.250
	93	12	32	.250
STANDARD	42	10	48	.130
	65	10	48	.188
	52	12	48	.130
STANDARD	43	10	54	.130
	45	10	54	.094
	51	20	54	.130
	201	10	60	.130

THREADED SHAFTS



TYPE	SHAFT LENGTH	THREAD LENGTH
21	½	⅜
22	⅜	3/16
23	⅜	¼
58	⅜	⅛
60	¾	½
81	⅝	¼
83	¾	⅜
85	1	⅜
105	⅝	⅜
120	⅝	⅛
134	¾	11/16

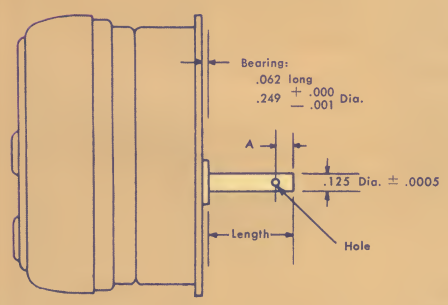
Left-hand threads have different type numbers and are available at factory.



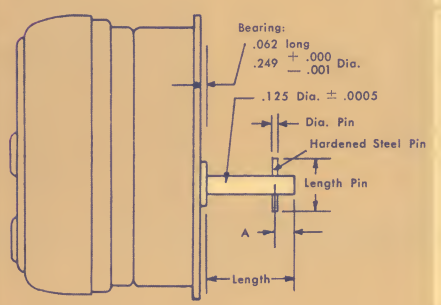
TYPE	SHAFT LENGTH	THREAD LENGTH
37	¾	⅜
68	½	⅜
72	⅜	¼
95	½	¼
107	1⅛	¾
121	⅜	⅛
126	⅜	3/32
131	¾	11/16
153	1⅛	⅛
215	1	⅜

Left-hand threads have different type numbers and are available at factory.

CROSS-DRILLED SHAFTS



TYPE	LENGTH	HOLE DIA.	DIM. A
70	⅝	.060	.125
71	⅜	.0625	.187
80	⅜	.046	.062
96	⅜	.0625	.250
123	⅝	.0625	.250
217	⅜	.060	.125



	SHAFT		PIN	
TYPE	LENGTH	DIM. A	LENGTH	DIA.
94	⅝	⅛	½	.062
157	⅜	3/16	½	.062
185	⅜	3/16	.218	.052
187	3/16	7/64	.218	.052
196	¼	5/64	.218	.052
210	3/16	5/64	.218	.052
236	½	5/32	.250	.062
243	½	5/32	.375	.062

HANSEN MFG. COMPANY, INC.

PRINCETON, INDIANA

SYNCHRON MOTOR PRICE LIST (Effective March 1, 1966)

(Motors having standard speeds, drives, leads and for 24v or 110v, 60c 3w)

Quantity	1 RPM and faster	4 RPH and faster	1 RPH and faster	1/24 RPH and faster	1/168 RPH and faster
1	5.00	5.00	5.00	7.50	8.25
10	4.00	4.00	4.00	6.50	7.25
25	3.00	3.10	3.15	4.00	4.75
50	2.50	2.60	2.65	3.50	4.25
100	1.92	2.02	2.07	2.92	3.47
250	1.86	1.96	2.01	2.56	3.01
500	1.80	1.90	1.95	2.45	2.75

Add 2c to above prices for rotor cover with window and bright finish.

Add 60c to the above prices for Instrument motor (designated-24) which features high temperature magnet wire, burnished pivots and reamed pivot holes in gear plates, brass first gear for additional strength, heavy rotor cover and bright nickel plated exterior. Window in rotor cover not available.

The above covers all motors except A43RA, I43RA and I129RB 1RPM 110v 60c motors which are used in standard clock movements. The price on these for less than 100 is:

1-9	3.00	50-99	2.25
10-24	2.75	100 or more, the above list applies	
25-49	2.50		

4 watt and 5 watt models available in speeds of 1 RPM and faster at adders of 8c and 16c respectively.

Add 10c for 1 or 2-way clutches, for speeds 1 RPH and faster; all others 25c. Clutches not available in speeds faster than 6 RPM.

Note: Where purpose of clutch is for resetting, one-way clutch is recommended. Primary purpose of two-way clutch is for gearing protection and is not intended for functional applications.

Add 10c for 220v, 10c for 50 cycle.

Motors may not be stalled if speed is slower than 1 RPM.

TANDEM MOTORS (reversible and double-power) start at a base price of $11.00 each in small quantities.

CHART DRIVES (with anti-backlash gearing) start at a base price of approximately $9.00 each in small quantities.

DUAL MOTOR UNITS start at a base price of approximately $31.00 each in small quantities.

Contact factory for higher quantity prices.

All prices are f.o.b. Princeton, Indiana.

HANSEN MFG. COMPANY, INC.

PRINCETON, INDIANA

Price List Effective March 1, 1966 on Clock Movements & Timing Machines

Quantity	C1 to C5 D1 to D5 rear set 110v 60c	C1 to C5 D1 to D5 rear set trains only (no motor)	No. 33-41 1 RPH 110v 60c	No. 33-79 1RP12H 110v 60c	No. 33-64 1RPD 110v 60c
	Movements		Machines	Machines	Machines
1	$6.50	$3.73	$6.50	$6.50	$6.75
10	5.50	2.98	5.50	5.50	5.75
25	4.50	2.23	4.50	4.50	4.75
50	4.00	1.98	4.00	4.00	4.25
100	2.50	1.65	2.45	2.55	2.75
250	2.46		2.41	2.51	2.71
500	2.32		2.27	2.37	2.57

EXTRAS ON ALL UNITS

50 cycle	.10
25 cycle	.25
220 volt	.10

COVERS (Available for C type movement only)

Attached to movement	.24
Packed separately	.29
Purchased outright	.33

Dust Band (Available for D type movement only)	.04
Bottom set (except 1 RPD)	.06
Center mounting with nut	.10

Extension rod assemblies:

Standard length, 1-99	.25
Standard length, 100 or more	.10

These prices are net f. o. b. our plant.